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* Optional:
(Q1, 2, 7, 15, 16, 17, 18, 20, 21, 24, 33)

Y8 Revision Test 2A · (Chapter 1 – Chapter 7)

Conventional Question

* 1.a) $3.5245 - \frac{11}{6} + 1.8479$

$\approx 3.5245 - 1.8333 + 1.8479$

≈ 3.5391

(ii) ≈ 3.539 (4.s.f.)

(i) ≈ 3.54 (3.s.f.)

1b) $1.95998 \div 2.8 \times 1.9$

$\approx 1.3299\ldots$

(i) ≈ 1.33 (3.s.f)

(ii) ≈ 1.330 (4.s.f)

* 2a) The length of the paper clip

= 3 cm

b) Degree of accuracy

= (correct to the nearest 0.5cm)

* because the smallest division of the ruler is 0.5 cm

* half of the smallest unit is $1/2$ = 0.5 cm

3) $(3-2x)(3+2x)$

$= 9 + 6x - 6x - 4x^2$

$= 9 - 4x^2$

* or apply differente of 2 squares

$(a-b)(a+b) \equiv a^2 - b^2$

$\therefore (3-2x)(3+2x) \equiv 3^2 - (2x)^2 = 9 - 4x^2$

4) $2(Ax+3)(x-4) \equiv 4x^2 + Bx + C$

L.H.S. $= 2(Ax^2 - 4Ax + 3x - 12)$

$= 2Ax^2 - 8Ax + 6x - 24$

$= 2Ax^2 + (6-8A)x - 24$

$\equiv 4x^2 + Bx + C$

$\therefore 2A = 4$, $A = 2$

$\therefore B = 6 - 8A$, $B = 6 - 8(2) = -10$

$C = -24$

5) $\begin{cases} 3x - y = 13 & \text{①} \\ 2x + 3y = -6 & \text{②} \end{cases}$

①×3 $9x - 3y = 39$ ③

②+③ $2x + 9x = -6 + 39$

$11x = 33$

$x = 3$

Sub $x = 3$ into ①

$3(3) - y = 13$

$y = 13 + 9$

$y = -4$

$\therefore \begin{cases} x = 3 \\ y = -4 \end{cases}$

6. $\frac{4\sqrt{3}}{\sqrt{8}}$

$= \frac{4\sqrt{3}\sqrt{8}}{8}$

$= \frac{4\sqrt{3} \times 2\sqrt{2}}{8}$

$= \sqrt{6}$

7) Estimate (accept reasonable answers)

a) $3.05 \times (349.89 \div 20.98)$

$\approx 3 \times 350 \div 21$

≈ 50

[strategy used: round the individual numbers to whole number first]

b) 484.1×8.02

$\approx 484 \times 8$

≈ 3872

[strategy used: round the decimals to whole number first]

8. $3(x^2+1)^2 - 12(x^2+1) + 12$

**

Let (x^2+1) be y

$3y^2 - 12y + 12$

$=(3y-6)(y-2)$

$3 \times 6 = 6$, $1 \times 2 = 6$, -12

sub x^2+1 into y

$3(x^2+1)^2 - 12(x^2+1) + 12$

$=(3(x^2+1)-6)(x^2+1-2)$

$=(3x^2+3-6)(x^2-1)$

$=(3x^2-3)(x^2-1)$

$=3(x^2-1)(x^2-1)$

$=3(x+1)(x-1)(x^2-1)$

$=3(x+1)(x-1)(x+1)(x-1)$

$=3(x+1)^2(x-1)^2$

9a) $\begin{cases} 2x-5y=2 & \text{①} \\ 3x+2y=22 & \text{②} \end{cases}$

① × 3 $\quad 6x-15y=6$ ——— ③

② × 2 $\quad 6x+4y=44$ ——— ④

④ − ③ $\quad 19y=38$

$y=2$

Sub $y=2$ into ①.

$2x-5(2)=2$

$2x=2+10$

$x=6$

$\therefore (x=6,\ y=2)$

9b) $\begin{cases} 2(a-b)-5(a+b)=2 \\ 3(a-b)+2(a+b)=22 \end{cases}$

When $a-b=x$

$a+b=y$

Then $\begin{cases} a-b=6 & \text{①} \\ a+b=2 & \text{②} \end{cases}$

① − ② $\quad -2b=4$

$b=-2$

Sub $b=-2$ into ①

$a-(-2)=6$

$a=4$

$\therefore (a=4,\ b=-2)$

10. Let the current age of Amy be x year old and Bonnie be y years old.

According to the question:

(#1) $\frac{\text{Amy}}{\text{Bonnie}} = \frac{4}{3} = \frac{x}{y}$

Simplify to: $3x - 4y = 0$ —— ①

(#2) $\frac{x-5}{y-5} = \frac{3}{2}$

$2(x-5) = 3(y-5)$

$2x - 10 = 3y - 15$

Simplify to: $2x - 3y = -5$ —— ②

Solve $\begin{cases} 3x - 4y = 0 & \text{—— ①} \\ 2x - 3y = -5 & \text{—— ②} \end{cases}$

①×2 $\quad 6x - 8y = 0$ —— ③

②×3 $\quad 6x - 9y = -15$ —— ④

③−④ $\quad y = 15$

Sub $y = 15$ into ①

$3(x) - 4(15) = 0$

$3x = 60$

$x = 20$

∴ Amy is 20 years old and Bonnie is 15 years old now.

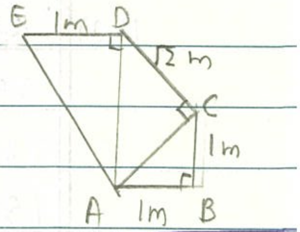
13b) The corresponding frequency of $\$155$ from the graph is $= 135$

frequency above $\$155 = 200 - 135 = 65$

$\frac{65}{200} \times 100\% = 32.5\%$

∴ 32.5% of books are $\$155$ above.

11) Area of pentagon ABCDE



= Area of △ABC

+ Area of △ACD

+ Area of △ADE

$= \frac{1 \times 1}{2} + \frac{\sqrt{2} \times \sqrt{2}}{2} + \frac{1 \times 2}{2}$

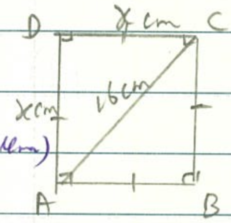
* $AC = \sqrt{1^2 + 1^2} = \sqrt{2}$

$AD = \sqrt{\sqrt{2}^2 + \sqrt{2}^2} = 2$

$= \frac{1}{2} + 1 + 1$

$= 2\frac{1}{2}\ m^2$ or $2.5\ m^2$

12) Let x cm be one side of the square



$x^2 + x^2 = 16^2$ (pyth. Theorem)

$2x^2 = 256$

$x^2 = 128$

Area of square $= x^2$

∴ $= 128\ cm^2$

13a i) The corresponding frequency of the lower quartile $= 200 \times 25\% = 50$

from the graph $P_{25} = \$105$

ii) The corresponding frequency of median $= 200 \times 50\% = 100$

from the graph $P_{50} = \$130$

iii) The corresponding frequency of the upper quartile $= 200 \times 75\% = 150$

from the graph $P_{75} = \$170$

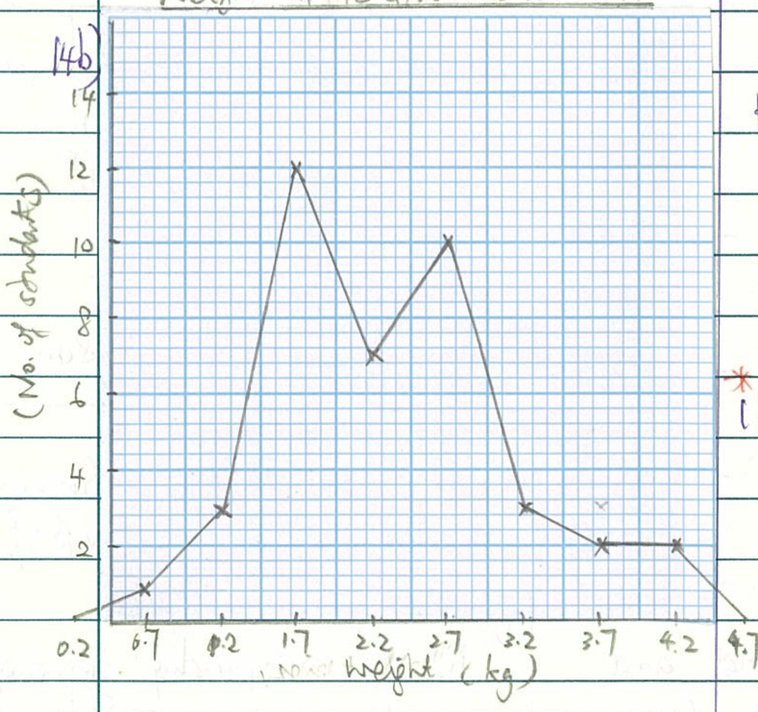
14a)

Weight of 40 students in S2A

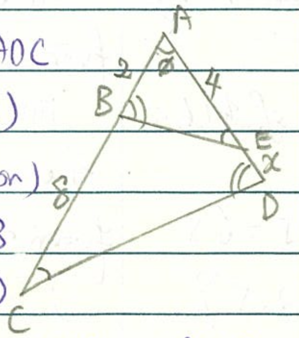
Weight (kg)	Class mark (kg)	Tally	Frequency
0.5–0.9	0.7	I	1
1.0–1.4	1.2	III	3
1.5–1.9	1.7	~~IIII~~ ~~IIII~~ II	12
2.0–2.4	2.2	~~IIII~~ II	7
2.5–2.9	2.7	~~IIII~~ ~~IIII~~	10
3.0–3.4	3.2	III	3
3.5–3.9	3.7	II	2
4.0–4.4	4.2	II	2
		Total:	40

14b)

Weight of 40 students in S2A



* 17a) To prove $\triangle ABE \sim \triangle ADC$



$\angle B = \angle D$ (given)

$\angle A = \angle A$ (common)

$\angle AEB = 180° - \angle A - \angle B$

$\angle ACD = 180° - \angle A - \angle D$

$\because \angle B = \angle D$ $\therefore \angle AEB = \angle ACD$

$\triangle ABE \sim \triangle ADC$ (AAA)

* 15a) Relative error

$= \frac{0.5}{175} = \frac{1}{350}$

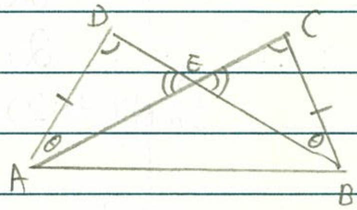
* b) Percentage error

$= \frac{0.5}{175} \times 100\%$

$\approx 0.2857\ldots\%$

$\approx 0.286\%$ (3.s.f.)

* 16a)



Prove that

$\triangle ADE \cong \triangle BCE$

Proof: $AD = BC$ (given)

$\angle D = \angle C$ (given)

$\angle DEA = \angle CEB$ (vert. opp. $\angle$s)

$\therefore \triangle ADE \cong \triangle BCE$ (SAA)

* 16b) $\because \triangle ADE \cong \triangle BCE$

$AE = BE$ (cor. sides eq.)

$\therefore \triangle AEB$ is an isosceles triangle (2 sides of the triangle are equal)

* 17b) $\because \triangle ABE \sim \triangle ADC$

i.e. $\frac{AB}{AD} = \frac{BE}{DC} = \frac{AE}{AC}$

$\frac{2}{AD} = \frac{4}{2+8}$

$AD = \frac{2(10)}{4}$

$AD = 5$

$\therefore AD = AE + ED$ $\therefore DE = 5 - 4 = 1$

*18 $14+21+32+41$

$\approx 10+20+30+40$

≈ 100

(Since most of the numbers are round down)

$\therefore 14+21+32+41 > 100$

$\therefore$ Victor can get the gift.

19a) In S2A, no. of students below 40.5

$= 8+5+3 = 16$

In S2B, no. of students below 40.5

$= 0$

19b) In S2A, above $70.5 = 4$

In S2B, above $70.5 = 6+5 = 11$

19c) Class S2B perform better, since there are more students getting higher scores and fewer students getting lower scores in S2B then S2A.

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20 Estimate each row have 10 words and there are 14 full rows

$\therefore$ There are approximately $10 \times 14 = 140$ words.

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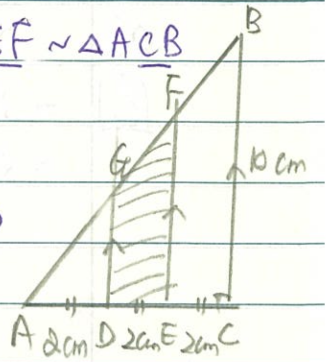
21. $\triangle ADG \sim \triangle AEF \sim \triangle ACB$



$\frac{EF}{BC} = \frac{AE}{AC}$

$EF = \frac{2+2}{2+2+2} \times 10$

$EF = \frac{4}{6} \times 10$

$EF = \frac{20}{3}$ cm

$\frac{DG}{BC} = \frac{AD}{AC}$

$DG = \frac{2}{6} \times 10$

$DG = \frac{10}{3}$ cm

$\therefore$ The area of the trapezium DEFG

$= \frac{(\frac{10}{3} + \frac{20}{3}) \times 2}{2}$

$= \frac{30}{3} = 10 \text{ cm}^2$

$\therefore$ MC Questions

22. $5.00204 \approx 5.0$ (2.s.f.)

$\boxed{B}$

23. $\boxed{C}$ vernier caliper measure small length.

24. $\boxed{B}$ (A.S.A.)

25. $\boxed{D}$

A $\times$ $\sqrt{\frac{243}{147}} = \frac{\sqrt{3 \times 81}}{\sqrt{3 \times 49}} = \frac{9\sqrt{3}}{4\sqrt{3}} = \frac{81}{49}$

B $\times$ $\frac{3\sqrt{8}}{\sqrt{50}} = \frac{3 \cdot 2\sqrt{2}}{\sqrt{25} \cdot \sqrt{2}} = \frac{3 \cdot 2}{5} = \frac{6}{5}$

C. $\times$ $\sqrt{0.00009} = \sqrt{\frac{9}{10000}} = \frac{3}{100}$

D. $\sqrt{2.5} = \sqrt{\frac{25}{10}} = \frac{5}{\sqrt{10}}$ ✓

26 $\boxed{C}$

$3x^2-24x+48$

$=3(x^2-8x+16)$

$=3(x-4)(x-4)$

I. 3 ✓

II. $x-4$ ✓

III $x-16$ ✗

I & II only

27 $\boxed{A}$

A. $-2x+4y=-2x+4y$ ✓

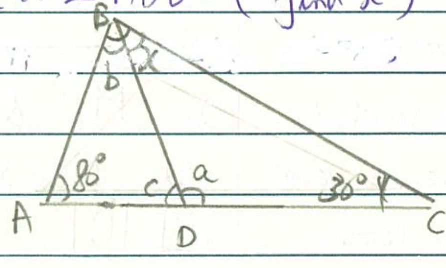
28 $\boxed{C}$

If you extend the two line they will interact at $(7,-1)$

$\therefore x=7,\ y=-1$

29 $\boxed{B}$

$\triangle ABC \sim \triangle ADB$ (find x)



$\because \angle ABC = \angle ADB$ (similar $\triangle$)

$\therefore b+x = c$ (corresponding $\angle$s)

$b+x = 180^\circ - 80^\circ - 30^\circ$ ($\angle$s sum of $\triangle$)

$c = b+x = 70^\circ$

$a+c = 180^\circ$ ($\angle$s on a st. line)

$a = 180^\circ - 70^\circ = 110^\circ$

$110^\circ + x + 30^\circ = 180^\circ$ ($\angle$s sum of $\triangle$)

$x = 180^\circ - 110^\circ - 30^\circ$

$x = 40^\circ$

30) $\boxed{D}$

$5x+2y=x+y=12-x-y$ (find y)

$5x+2y=x+y$ —— ①

$12-x-y=x+y$ —— ②

① ⇒ $4x+y=0$ —— ③

② ⇒ $2x+2y=12$

$x+y=6$ —— ④

④−③ $3x=-6$

$x=-2$

$y=6-(-2)$

$y=8$

31) $\boxed{A}$

I. $60^2+11^2=3721=61^2$ ✓

II. $8^2+\sqrt{161}^2=225=15^2$ ✓

III. $\sqrt{12}^2+\sqrt{13}^2=25 \neq (\sqrt{5})^2 \neq 5$

Only I & II are correct

32) $\boxed{B}$

frequency for $P_{40} = 40 \times \frac{40}{100} = 16$

$P_{40} = 164$ cm

33) $\boxed{C}$

34) $\boxed{B}$

2.2kg (correct to 0.2kg)

error is 0.1kg

it didn't round up

$\therefore$ it is $2.2-0.1 \approx 2.1$ kg.

35) $\boxed{D}$

cumulative frequency should no go down as in D.